apparently similar groups the direction of difference is reversed.] Numbers and mathematical treatment as such can never lead us to truth, apart from consideration of the methods and conditions and more general inductive procedures which we use in obtaining the numerical results. The beginnings of a truly critical work in this connection have been made by Lexis and von Bortkiewicz, a brief account of whose methods concludes the treatise.

It is easy to say in conclusion that logician, mathematician, and man of science owe a debt of gratitude to the author of the treatise for making a first truly comprehensive and critical study of questions which are of fundamental significance to all three disciplines. Not all logicians, of course, will agree that the distinction between knowledge gained by "direct" perception and that gained by argument is logically fundamental. Before we can apply the author's principles of induction to psychical research, for instance, we must have a theory of perception which will enable us to say more definitely whether or not we can directly perceive "spirits", a question which the author's system leaves open. Detailed and critical evaluation of the treatise, however, must be left to those more competent than the present reviewer.

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Education and World Citizenship: An Essay towards a Science of Education. By JAMES CLERK MAXWELL GARNETT. Cambridge University Press, London, 1921. Pp. 515.

Any serious attempt on the part of an English educator to replace the traditional set of mind toward an art of education by a scientific attitude is worthy of notice. When an educator of the prominence of Maxwell Garnett (General Secretary of the League of Nations Union, and Dean of the Faculty of Technology in the Victoria University of Manchester) gives up all his spare time for eight years to the preparation of so pretentious a volume, certainly it is worth more than passing mention. To the Englishman, the book will doubtless mark a significant step toward the recognition of psychology as related to education. To the American, it indicates the systematic and cautious method by which the educators of the mother country are testing materials which, for some years, have been accepted in this country as basic. The book also shows something of the present state of mind of the typical English educator of the more advanced school.

Perhaps the best way in which to contrast the English and the American point of view is to give, without comments, the principal sources of the author's information, and the conclusions he has reached. The book is in three parts, each one of which will be briefly treated.

Book I gives three chapters to a consideration of the aims of education in the past, with a statement of the present situation. Rather startling is the statement that "the most easily observed characteristic of English education at the present time is perhaps its aimlessness." Accordingly, the author discusses a basis for determining a suitable aim toward which a science of education should be directed; Professor John Adams' conclusion that self-realization and a many-sided interest cover the whole field of educational objectives especially appeals to him, and so he finally concludes that the first aim of education during adolescence and maturity must be to build up a "single wide interest."

In Book II (16 chapters) "some of the conceptions of physiological psychology are employed in the attempt to analyse the foundations of character and their effect upon behavior." Rejecting a behavioristic view, and the doctrine of psychophysical parallelism, the author assumes "what Dr. McDougall calls the 'old common-sense view' that psychophysical interaction does in fact take place." Accordingly, in his psychological

presentation, he follows James and McDougall, except where the work of Spearman, Pearson, Hart, Cyril Burt and Edward Webb seems to give him experimental data which amplify and verify otherwise debatable conclusions.

As a result of this discussion, five "Laws of Thought" are enunciated. They are:

1. To every psychosis there corresponds a neurosis.
2. Excitement in the nervous arc tends to spread to every other arc that is connected with the first through synapses, the insulation of which the excitement in question is intense enough to overcome.
3. Any nervous arc of the higher level, if intensely excited relatively to other higher level arcs, tends to drain the impulses from those other arcs.
4. Will, measured by the general factor, "g", can reinforce the excitement in any excited system of higher level arcs; and so may cause that system to drain the excitement from all other active arcs of the higher level.
5. Action is the normal end of every train of thought.

Having arrived at these laws, and having noted that the first four laws show that a man's thought is determined, apart from incoming sense impressions, by his neurography and his will, it follows that, given a man's environment to which these incoming sense-impressions are due, his reaction will be determined when his neurography and his will are determinately known. "At least, we have no evidence of any other factors, and therefore do well to accept this view as the simplest possible hypothesis that fits all the known facts." A strong character is then made up of a neurography in the form defined as a single wide interest-system, and a strong will that cooperates with the single wide interest in guiding thought and conduct. Any one whose character is of this kind will possess an outlook on life which is something more than a philosophy, for it will show everything focussed in a supreme and dominant purpose. This purpose introduces deep emotional elements into his philosophy and transforms it into a religion, along with which he should have faith and hope.....To achieve correspondence between the central elements of one's neurography and the central essence of the endarchy of science is the most important step, on the neurographic side, towards the formation of character. One may achieve this either by accepting, provisionally, prevailing opinions, or by seeking an inspiration on one's own account. In either case, one must proceed to act on one's provisional hypothesis with a view to its verification. All conditions are satisfied by the fundamental Christian hypothesis: that God is the center of the universe, the central fact of the endarchy of science; that knowledge of God begins by faith; that hope of eternal life belongs to people who seek to know God; that brotherly love is of the very essence of God; and that all human beings are in peculiarly close relation to God. Thus, in a maximally progressive community, the common supreme purpose must be the Christian character just defined. The aim of education, the world over, follows at once: to form Christian characters, with all the manifold outward differences that are necessary if their several owners are to cooperate effectively for the fulfillment of their common supreme purpose.

Book III (7 chapters) describes a system of education to realize this aim, especially applicable to the situation in England, and sets forth plans for bringing her educational system into harmony with this aim within the next ten years. The problem is dependent primarily on knowing what each person's occupation is going to be. So it is necessary to investigate the qualities, especially the kind of "single wide interest", and the degree of "general ability or g", required by those who are to occupy the various positions in industry, commerce, and other essential departments of English life, and afterwards to indicate a means of developing the required qualities in a sufficient number of persons selected on account of their in-

nate aptitudes for each different kind of work. This selection must be made irrespective of the young peoples' place of residence and of their private financial circumstances....."We should neither ignore the value of education altogether, nor attempt to provide all men and women, whatever their ability or inclination, with identical education, but rather bring every kind of education within the reach of all citizens whose educational promise is sufficient to justify their selection to receive, if necessary at the public expense, that type of education, which, having regard to their ability and inclination, will best fit them to serve their fellows and to find their own happiness in that service." The classification of various kinds of public service is to be: (*a*) leaders in thought and action; (*b*) managers, officials, and others of intermediate rank; (*c*) craftsmen, skilled tradesmen, and leading hands; and (*d*) laborers, repetition workers, and other unskilled persons without specific training. In order to meet the demands of training for these various classes, attention should be paid to the application of the principles already laid down to methods of instruction and to types of schools. Both of these factors are touched upon at greater length than would be expected in a volume of this scope. The plan of schools includes ample provision for elementary, secondary, technical, university, graduate, and research institutions, and stresses particularly the need of part-time institutions of each grade—junior part-time, senior part-time, intermediate, advanced, and university part-time schools and classes. Ample provision is indicated for transfer from any one type of institution to another, when the right sort of ability is developed. In order to facilitate the universal opportunity, an elaborate national scholarship system is suggested, to cover every sort of training.

Finally, the volume closes with stress upon the supreme importance of training, appointing, and retaining teachers of the right kind: "in short, a perfect system of education requires, above all, perfect teachers; and perfect men and women, whatever their walk in life,—be it teaching or any other,—require a perfect education, an education that achieves its aim and so forms Christian characters."

One cannot imagine a psychologist reading Book II without reacting vigorously against certain conclusions there drawn; and one is certainly impressed no more by the matter included than by certain notable omissions. Yet the final impression is that an important advance has been made toward the end the author has had in mind, namely, the recognition in England of the applications of science to education. To the American educator, as well, there is much, especially in Book III, which is worthy of close attention.

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